

Mori et al.  
U.S.S.N. 08/726,613  
Page 2

This listing of claims will replace all prior versions in the application.

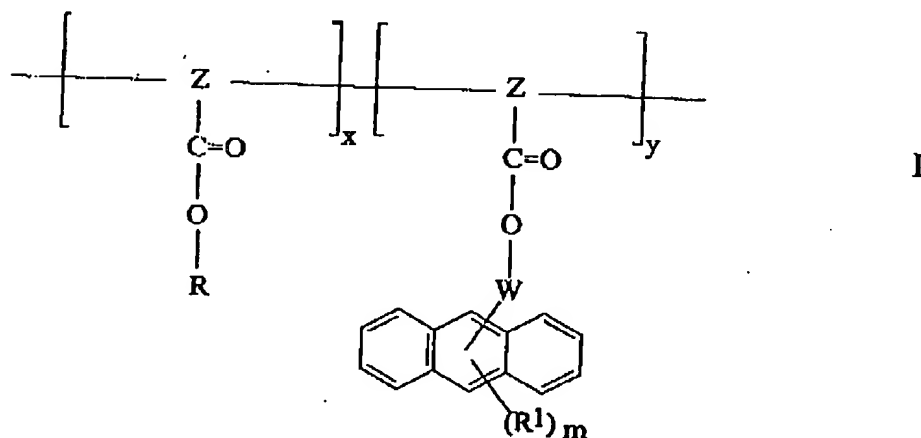
Claim 1. (previously presented) A photoresist composition comprising a polymer binder, a photoactive component and a dye compound that contains anthracene groups, said dye compound being a polymer wherein the polymer has a weight average molecular weight of at least about 5,000.

Claims 2-3. (cancelled)

Claim 4. (original) The photoresist of claim 1 wherein the dye is a copolymer.

Claim 5. (original) The photoresist of claim 1 wherein the dye is a copolymer that contains anthracene and acrylic units.

Claim 6. (original) The photoresist of claim 1 wherein the dye compound comprises a structure of the following Formula I:



Mori et al.  
U.S.S.N. 08/726,613  
Page 3

wherein each R is independently substituted or unsubstituted alkyl;

W is a bond or substituted or unsubstituted alkylene;

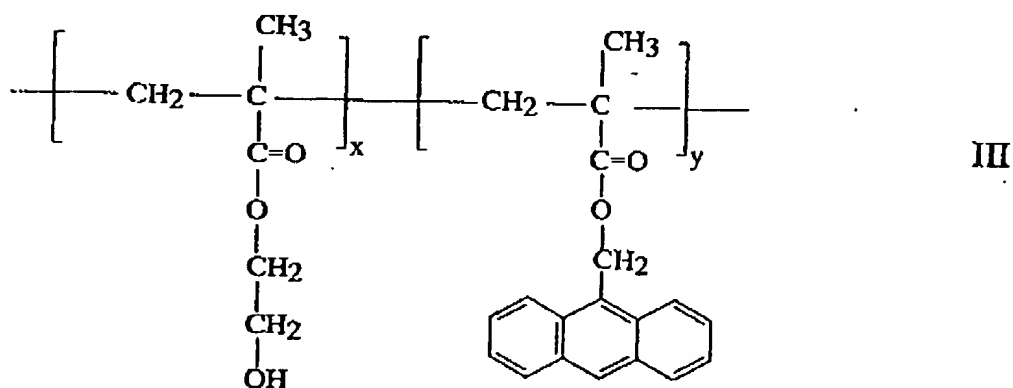
each R1 may be independently halogen; substituted or unsubstituted alkyl; substituted or unsubstituted alkoxy; substituted or unsubstituted alkenyl; substituted or unsubstituted alkynyl; substituted or unsubstituted alkylthio; cyano; nitro; amino; hydroxyl;

m is an integer of from 0 to 9;

x and y are the mole fractions of the respective units; and

each Z is a bridge group between polymer units.

Claim 7. (previously presented) The photoresist of claim 1 wherein the dye comprises a structure of the following formula III:



Claim 8. (original) The photoresist of claim 1 wherein the resist is a positive-acting resist.

Claim 9. (original) The photoresist of claim 1 wherein the resist is a negative-acting resist.

Mori et al.  
U.S.S.N. 08/726,613  
Page 4

Claim 10. (previously presented) A photoresist that comprises a resin binder, a photoactive component and a polymeric dye that contains one or more polycyclic chromophores, said chromophore being selected from the group consisting of phenanthryl, acridine, quinolinyl and ring substituted quinolinyl.

Claim 11. (original) The photoresist of claim 10 wherein the chromophores absorb deep UV radiation.

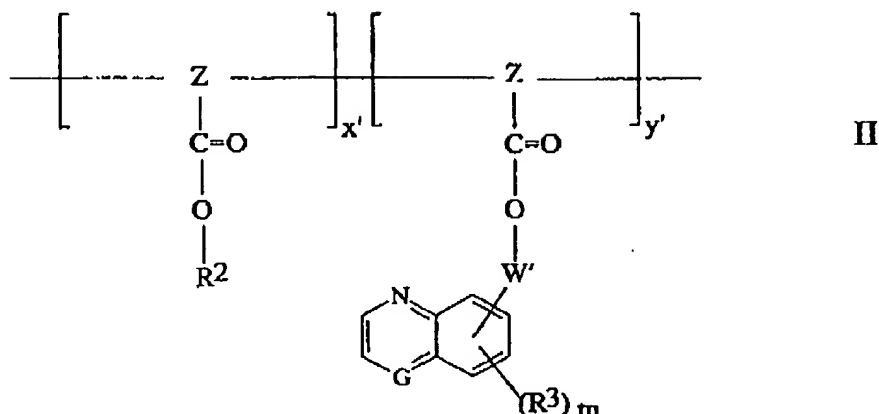
Claim 12. (original) The photoresist of claim 10 wherein the chromophores are selected from the group consisting of phenanthryl, acridine, quinolinyl and ring-substituted quinolinyl.

Claim 13. (original) The photoresist of claim 10 wherein the dye is a copolymer.

Claim 14. (original) The photoresist of claim 10 wherein the dye is an acrylic copolymer.

Claim 15. (original) The photoresist of claim 10 wherein the dye comprises a structure of the following Formula II:

Mori et al.  
U.S.S.N. 08/726,613  
Page 5



each  $R^2$  is independently substituted or unsubstituted alkyl;

$W'$  is a bond or substituted or unsubstituted alkylene;

$G$  is a carbon, nitrogen, oxygen or sulfur;

each  $R^3$  may be independently halogen; substituted or unsubstituted alkyl; substituted or unsubstituted alkoxy; substituted or unsubstituted alkenyl; substituted or unsubstituted alkynyl; substituted or unsubstituted alkylthio; cyano; nitro; amino; hydroxyl; etc.;

$m$  is an integer of from 0;

$x'$  and  $y'$  are mole fractions of the respective units; and

each  $Z$  is a bridge group between polymer units.

Claims 16-17. (cancelled)

Claim 18. (previously presented) An article of manufacture having coated thereon a photoresist composition comprising a polymer binder, a photoactive component and a dye compound that contains anthracene groups, said dye compound being a polymer wherein the polymer has a weight average molecular weight of at least about 5,000.

Mori et al.  
U.S.S.N. 08/726,613  
Page 6

Claim 19. (previously presented) The article of claim 18 wherein the substrate is a microelectronic wafer or a flat panel display substrate.

Claim 20. (previously presented) An article of manufacture comprising a substrate that is an integrated circuit or a flat panel display, the substrate having coated thereon a photoresist composition comprising a resin binder, a photoactive component and a polymeric dye that contains one or more polycyclic chromophores, said dye compound being a polymer wherein the polymer has a weight average molecular weight of at least about 5,000.

Claim 22. (previously presented) A light sensitive composition that comprises a resin binder, a photoacid generator compound and a and a polymeric dye that contains one or more polycyclic chromophores, said dye compound being a polymer wherein the polymer has a weight average molecular weight of at least about 5,000.

Claim 23. (previously presented) The light sensitive composition of claim 22 wherein the chromophores absorb deep UV radiation.

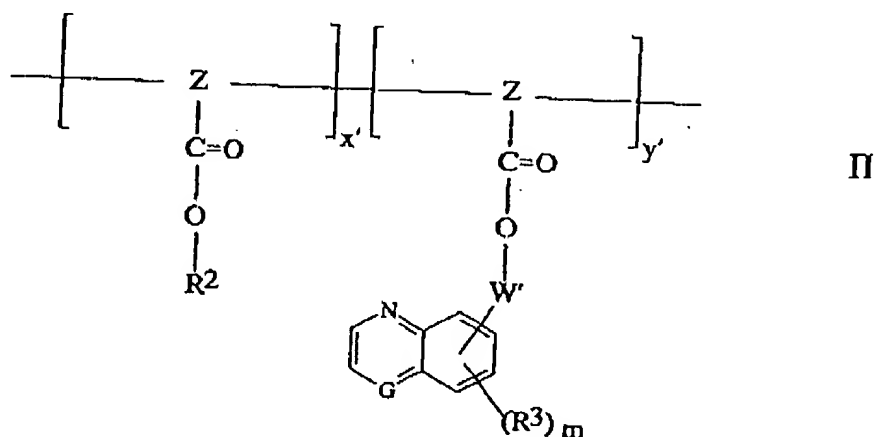
Claim 24. (previously presented) The light sensitive composition of claim 22 wherein the chromophores are selected from the group consisting of anthryl, phenanthryl, acridine, quinoliny and ring-substituted quinoliny.

Claim 25. (previously presented) The light sensitive composition of claim 22 wherein the dye is a copolymer.

Claim 26. (previously presented) The light sensitive composition of claim 22 wherein the dye is an acrylic copolymer.

Mori et al.  
U.S.S.N. 08/726,613  
Page 7

Claim 27. (previously presented) The light sensitive composition of claim 22 wherein the dye comprises a structure of the following Formula:



each  $R^2$  is independently substituted or unsubstituted alkyl;  
 $W'$  is a bond or substituted or unsubstituted alkylene;  
 $G$  is a carbon, nitrogen, oxygen or sulfur;  
 each  $R^3$  may be independently halogen; substituted or unsubstituted alkyl; substituted or unsubstituted alkoxy; substituted or unsubstituted alkenyl; substituted or unsubstituted alkynyl; substituted or unsubstituted alkylthio; cyano; nitro; amino; hydroxyl; etc.;  
 $m$  is an integer of from 0;  
 $x'$  and  $y'$  are mole fractions of the respective units; and  
 each  $Z$  is a bridge group between polymer units.

Claims 28-46 (cancelled)

Mori et al.  
U.S.S.N. 08/726,613  
Page 8

Claim 47. (previously presented) The article of claim 20 wherein the photoactive compound is a photoacid generator compound.

Claim 48. (previously presented) The article of claim 20 wherein the photoactive compound is an onium salt, a nitrobenzyl ether, an s-triazine compound, or a halogenated non-ionic photoacid generating compound.

Claim 49. (previously presented) The article of claim 20 wherein the photoactive compound is an onium salt, a nitrobenzyl ether, an s-triazine compound, or a halogenated non-ionic photoacid generating compound.

Claim 50. (previously presented) A method for forming a photoresist relief image comprising:

applying a coating layer of a photoresist composition on an integrated circuit substrate or or a flat panel display, the photoresist composition comprising a resin binder, a photoactive component and a polymeric dye that contains one or more polycyclic chromophores, said dye compound being a polymer wherein the polymer has a weight average molecular weight of at least about 5,000; and

exposing and developing the photoresist composition coating layer to provide a photoresist relief image.

Claim 51. (previously presented) The method of claim 50 wherein the photoresist coating layer is exposed with radiation having a wavelength of about 300 nm or less.

Claim 52. (previously presented) The method of claim 50 wherein the photoresist coating layer is exposed with radiation having a wavelength of about 248 nm or less.

Mori et al.  
U.S.S.N. 08/726,613  
Page 9

Claim 53. (previously presented) The method of claim 50 wherein the substrate is a microelectronic wafer substrate.

Claim 54. (previously presented) The method of claim 50 wherein the polymer has a weight average molecular weight of at least about 7,000.

Claim 55. (previously presented) The method of claim 50 wherein the polymer has a weight average molecular weight of at least about 8,000.

Claim 56. (previously presented) The method of claim 50 wherein the photoactive compound is a photoacid generator compound.

Claim 57. (previously presented) The method of claim 50 wherein the photoactive compound is an onium salt, a nitrobenzyl ether, an s-triazine compound, or a halogenated non-ionic photoacid generating compound.

Claim 58. (previously presented) The method of claim 50 wherein the photoresist is a chemically-amplified positive-acting resist.

Claim 59. (previously presented) The method of claim 50 wherein the photoresist is a negative-acting resist.

Claim 60. (previously presented) A method for forming a photoresist relief image comprising:

applying a coating layer of a photoresist composition on a substrate, the photoresist composition comprising a photoactive component and a dye compound that comprises an



Mori et al.  
U.S.S.N. 08/726,613  
Page 10

anthracene group, the dye compound being a polymer having a weight average molecular weight of at least about 5,000; and

exposing and developing the photoresist composition coating layer to provide a photoresist relief image.

Claim 61. (previously presented) The method of claim 60 wherein the photoresist coating layer is exposed with radiation having a wavelength of about 300 nm or less.

Claim 62. (previously presented) The method of claim 60 wherein the photoresist coating layer is exposed with radiation having a wavelength of about 248 nm or less.

Claim 63. (previously presented) The method of claim 60 wherein the substrate is a microelectronic wafer substrate.

Claim 64. (previously presented) The method of claim 60 wherein the polymer has a weight average molecular weight of at least about 7,000.

Claim 65. (previously presented) The method of claim 60 wherein the polymer is an anthracene acrylic copolymer.

Claim 66. (previously presented) The method of claim 60 wherein the photoactive component is a photoacid generator compound.

Claim 67. (previously presented) The method of claim 60 wherein the photoactive compound is an onium salt, a nitrobenzyl ether, an s-triazine, or a halogenated non-ionic photoacid generating compound.

Mori et al.  
U.S.S.N. 08/726,613  
Page 11

Claim 68. (previously presented) The method of claim 60 wherein the photoresist is a chemically-amplified positive-acting resist.

Claim 69. (previously presented) The method of claim 60 wherein the photoresist is a negative-acting resist.

Claim 70. (previously presented) A method for forming a photoresist relief image comprising:

applying a coating layer of a photoresist composition on a substrate, the photoresist composition comprising a photoactive component and a dye compound that comprises one or more polycyclic chromophores, the chromophores being selected from the group consisting of phenanthryl, acridine, quiolinyl and ring substituted quinolinyl; and

exposing and developing the photoresist composition coating layer to provide a photoresist relief image.

Claim 71. (previously presented) The method of claim 70 wherein the photoresist coating layer is exposed with radiation having a wavelength of about 300 nm or less.

Claim 72. (previously presented) The method of claim 70 wherein the photoresist coating layer is exposed with radiation having a wavelength of about 248 nm or less.

Claim 73. (previously presented) The method of claim 70 wherein the substrate is a microelectronic wafer substrate.

Claim 74. (previously presented) The method of claim 70 wherein the polymer has a weight average molecular weight of at least about 5,000.

Mori et al.  
U.S.S.N. 08/726,613  
Page 12

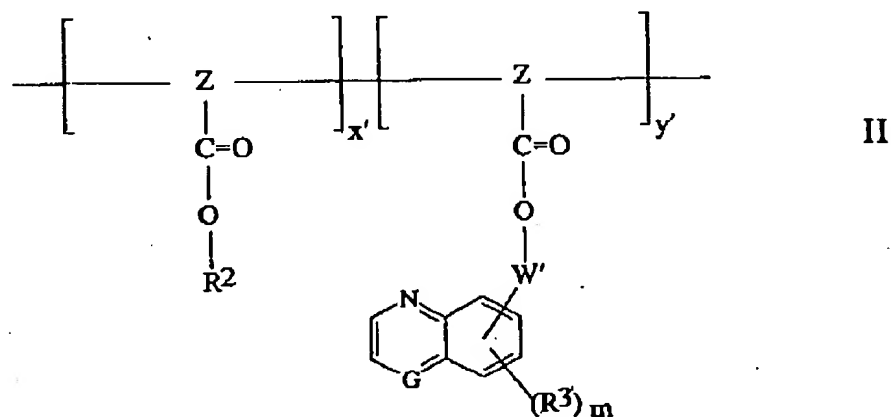
Claim 75. (previously presented) The method of claim 70 wherein the photoactive component is a photoacid generator compound.

Claim 76. (previously presented) The method of claim 70 wherein the photoactive compound is an onium salt, a nitrobenzyl ether, an s-triazine, or a halogenated non-ionic photoacid generating compound.

Claim 77. (previously presented) The method of claim 70 wherein the photoresist is a chemically-amplified positive-acting resist.

Claim 78. (previously presented) The method of claim 70 wherein the photoresist is a negative-acting resist.

Claim 79. (previously presented) A photoresist composition that comprises a resin binder, a photoacid generator compound and a dye that comprises a structure of the following formula:



Mori et al.  
U.S.S.N. 08/726,613  
Page 13

each  $R^2$  is independently substituted or unsubstituted alkyl;

$W'$  is a bond or substituted or unsubstituted alkylene;

$G$  is a carbon, nitrogen, oxygen or sulfur;

each  $R^3$  may be independently halogen; substituted or unsubstituted alkyl; substituted or unsubstituted alkoxy; substituted or unsubstituted alkenyl; substituted or unsubstituted alkynyl; substituted or unsubstituted alkylthio; cyano; nitro; amino; hydroxyl; etc.;

$m$  is an integer of from 0 to 7;

$x'$  and  $y'$  are mole fractions of the respective units; and

each  $Z$  is a bridge group between polymer units.

Claim 80. (previously amended) The photoresist of claim 79 wherein the polymer has a weight average molecular weight of at least about 5,000.

Claim 81. (previously presented) The photoresist of claim 79 wherein the photoresist is a chemically-amplified positive-acting resist.

Claim 82. (previously presented) The method of claim 79 wherein the photoresist is a negative-acting resist.

Claim 83. (new) A chemically-amplified photoresist composition comprising a polymer binder, a photoactive component and dye polymer has a weight average molecular weight of at least about 5,000 and comprises copolymer that contains anthracene and acrylic units.

Claim 84. (new) The photoresist composition of claim 83 wherein the polymer binder comprises phenolic and non-phenolic units.

Mori et al.  
U.S.S.N. 08/726,613  
Page 14

Claim 85. (new) The photoresist composition of claim 84 wherein the polymer binder comprises acid labile groups on non-phenolic polymer units.

Claim 86. (new) The photoresist composition of claim 83 wherein the polymer binder is a non-phenolic resin.

Claim 87. (new) The photoresist composition of claim 83 wherein the polymer binder comprises polymerized alkyl acrylate units and a vinylalicyclic units.

Claim 88. (new) A chemically-amplified photoresist composition comprising a non-phenolic polymer binder, a photoactive component and dye polymer that has a weight average molecular weight of at least about 5,000 and comprises anthracene groups.

Claim 89 (new) The photoresist composition of claim 88 wherein the polymer binder comprises polymerized alkyl acrylate units and vinylalicyclic units.

Claim 90. (new) A chemically-amplified positive photoresist composition comprising a non-phenolic resin binder, a photoactive component and a polymeric dye that contains one or more polycyclic chromophores, the dye polymer having a weight average molecular weight of at least about 5,000.

Claim 91. (new) The article of claim 90 wherein the polymer binder comprises polymerized alkyl acrylate units and vinylalicyclic units.